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The effect of cognitive behavioral therapy in managing blood-injury-injection phobia (BIIP) in a biomedical laboratory setting

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ABSTRACT

Purpose – This study aimed to examine the effect of Cognitive Behavioral Therapy (CBT) in reducing vasovagal responses among individuals with BIIP, as measured by indicators of fear severity, perception, heart rate, and oxygen saturation.

Design/methods/approach – This study employed a pre-experimental design using a one-group pretest–posttest approach with purposive sampling. The sample consisted of 24 undergraduate students enrolled in a Public Health program. Four variables were examined: fear severity, perception, heart rate, and oxygen saturation. Data were analyzed using univariate analysis through frequency distribution and tabulation. Bivariate analysis was conducted using the Wilcoxon Signed Rank Test to determine the significance of therapeutic outcomes by comparing pretest and posttest results. The Kruskal–Wallis test with post hoc analysis was also applied to identify which CBT sessions were most effective in reducing BIIP-related anxiety symptoms.

Findings – Of the four variables examined, fear severity and perception showed p-values greater than 0.05, indicating non-significant changes following the intervention, although percentage improvements were observed. Heart rate demonstrated a statistically significant effect, with a p-value of 0.028 (< 0.05), indicating a significant improvement particularly during sessions four and five. In contrast, oxygen saturation yielded a p-value of 0.485, suggesting no statistically significant improvement across sessions one through five.

Research implications/limitations – These findings suggest that CBT may be particularly effective in modulating physiological responses associated with BIIP in educational laboratory settings. However, the absence of a control group, the relatively small sample size, and variability in session attendance limit the generalizability of the results. Future studies employing controlled experimental designs and larger samples are recommended to strengthen causal inferences.

Originality/value – This study contributes original empirical evidence by integrating psychological and physiological indicators to evaluate the effectiveness of CBT for BIIP within a biomedical laboratory context. The findings offer practical insights for implementing CBT-based interventions to enhance student safety and preparedness during laboratory-based blood-related procedures.

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Introduction

The improvement of educational quality is influenced by several factors, including the professionalism of teaching staff and the effectiveness of laboratory-based activities. Laboratory activities must be ensured to operate optimally, safely, and in a healthy manner in order to support and enhance the quality of education (Adriani, 2016; Nurhayati et al., 2022). One of the barriers that may hinder optimal, safe, and healthy laboratory activities is the presence of fear or anxiety associated with blood sampling procedures, which may contribute to increased morbidity. According to Bayu's findings as cited in Sari et al. (2024), approximately 85% of occupational accidents are attributable to human factors, which are strongly influenced by psychological conditions.

Data from the Labour Force Survey (LFS) indicate that work-related stress manifested as depression and anxiety affected 52% of 1.9 million workers in 2024 (Health and Safety Executive, 2025). The World Health Organization further emphasizes that anxiety disorders can disrupt occupational, social, familial, and educational functioning (World Health Organization, 2025). The Public Health Laboratory at Universitas Negeri Malang (Lab IKM UM) serves as a facility for learning, research, and community service activities. This laboratory consists of four divisions: the Epidemiology and Environmental Health Laboratory, the Nutrition Laboratory, the Occupational Health and Safety (OHS) and Reproductive Health Laboratory, and the Biomedical Laboratory.

Laboratory-based learning activities conducted during the odd semester include Biomedical Practicum for first-year students. These practicum sessions encompass a wide range of procedures, such as blood glucose, total cholesterol, and uric acid measurements; pulmonary function assessment; bone density and handgrip strength testing; anthropometric measurements; macronutrient biochemistry analysis; urinalysis; visual, color blindness, and hearing tests; blood group, hemoglobin, and HbA1c testing; rapid diagnostic tests for malaria, HIV, pregnancy, and drugs; body fat measurements; as well as histological and parasitological specimen observations. Based on the nature of these procedures, several blood sampling activities have been associated with occupational accidents. Such incidents include syncope, dizziness, and weakness resulting from capillary blood sampling using lancets or small needles inserted into the fingertip to obtain capillary blood specimens.

According to the 2024 Service Excellence Survey conducted by the Public Health Laboratory at Universitas Negeri Malang, 31.3% of students reported having experienced laboratory-related accidents (Laboratorium IKM UM, 2024). The most frequently reported incident was tripping over loose cables, followed by syncope, dizziness, and weakness associated with blood sampling procedures. While the most common incident—tripping—has been addressed through cable management, safety briefings, and corrective action plans implemented by the faculty, the second most frequent incidents remain unresolved. This persistence is largely attributed to students who deny having a phobia or force themselves to undergo blood sampling due to the perceived importance of practicum activities.

Fear is elicited by diverse stimuli, and each specific phobia is characterized by a particular stimulus perceived as threatening. Specific phobias are marked by intense and persistent fear or anxiety as part of the body's defensive mechanism in response to certain situations or conditions. Fear resulting from phobic reactions is known to cause clinically significant physiological disturbances (Wilson et al., 2016). *Blood-Injury-Injection Phobia* (BIIP) represents a specific phobia triggered by exposure to blood, injuries, or injection-

related events (Miloyan & Eaton, 2016). Research by Wani et al. (2016) further indicates that BIIP, at certain levels, can restrict individual productivity.

In its application, Cognitive Behavioral Therapy (CBT) reconstructs individuals' cognitive, emotional, and behavioral capacities to enable more adaptive decision-making. According to Mason et al. (2022), CBT is effective in deconstructing and reorienting maladaptive cognitive patterns associated with BIIP and has been shown to significantly alleviate BIIP-related symptoms. In cases of BIIP, maladaptive cognitive distortions that interfere with individual health include: (1) *tunnel vision*, in which individuals narrowly focus on information that confirms negative thoughts; (2) *arbitrary inference*, where individuals draw negative conclusions without sufficient evidence; (3) *overgeneralization*, characterized by drawing broad conclusions from limited experiences; and (4) *selective abstraction*, a cognitive distortion in which individuals attend exclusively to negative information while disregarding positive aspects (Wardani et al., 2020).

Within educational contexts, CBT has been shown to reduce anxiety, modify negative thinking patterns, enhance concentration, improve classroom attendance and participation, and promote better academic achievement. Empirical findings by Izzah et al. (2025) demonstrate that CBT exerts a significant influence in educational and counseling settings, particularly in addressing students' psychological barriers. Through a CBT-based approach, which has been proven effective in treating phobias, students are expected to overcome their fear of injections and blood sampling procedures. This therapeutic approach focuses on modifying negative cognitive patterns associated with blood-related events (Agustini, 2019).

Accordingly, the present study aims to examine the effect of Cognitive Behavioral Therapy on reducing vasovagal and anxiety-related responses among students with Blood-Injury-Injection Phobia, as measured through indicators of fear severity, perception, heart rate, and oxygen saturation in a biomedical laboratory setting. This investigation is intended to provide empirical evidence to support the implementation of CBT as a practical psychological intervention to enhance student safety and preparedness during laboratory-based blood-related procedures.

Methods

This study employed a pre-experimental design using a one-group pretest–posttest approach, aiming to determine the significance of the effects of Cognitive Behavioral Therapy (CBT) administered to students with Blood-Injury-Injection Phobia (BIIP) by comparing pretest and posttest outcomes. This design was considered appropriate given that the study population consisted of fewer than 60 participants. Due to this limitation, no comparison with a control group was conducted; however, the effects of the intervention were examined through intra-individual changes observed before and after the CBT intervention.

The research instruments consisted of CBT therapy videos and a structured questionnaire, which demonstrated high internal consistency with a Cronbach's Alpha coefficient of 0.941. These instruments were adapted and administered through Google Forms. Fear severity was measured using a numerical fear scale ranging from 0 to 10, where 0 indicated "no fear at all" and 10 indicated "extreme fear" (Ruiz-García et al., 2019; Swarjana, 2022).

Perception was assessed using a Likert scale, with response options coded as 1 = "Strongly Disagree," 2 = "Disagree," 3 = "Agree," and 4 = "Strongly Agree." Heart rate and oxygen saturation were measured using a pulse oximeter before and after the CBT intervention. The results of these physiological measurements were categorized as "Normal" or "Abnormal." A heart rate ranging from 60 to 100 beats per minute was classified as normal, while values below or above this range were categorized as abnormal. Similarly, oxygen saturation levels of 97–98% were classified as normal, whereas values below 97% were considered abnormal (Jarvis, 2016).

The target population comprised 36 first-year undergraduate students enrolled in the Public Health Study Program, Faculty of Sports Science, Universitas Negeri Malang, during the 2025/2026 academic year, all of whom had a history of *Blood-Injury-Injection Phobia* (BIIP). A total of 24 students were selected as study participants. Purposive sampling was employed, with inclusion criteria defined as students' willingness to participate in at least one CBT session.

Data were analyzed using univariate analysis to present frequency distributions and data tabulations. Bivariate analysis was conducted using the Wilcoxon Signed Rank Test for one-group pretest–posttest comparisons to determine the significance of the therapeutic intervention. Additionally, the Kruskal–Wallis test was applied to identify differences across CBT sessions, followed by post hoc analysis to determine which sessions were most effective in reducing BIIP-related anxiety symptoms.

The Cognitive Behavioral Therapy intervention consisted of five sessions, conducted as follows.

Session 1: The first session began with an explanation of the research activities and the completion of written informed consent. Participants were then exposed to a video stimulus. After viewing the video, participants measured their heart rate and oxygen saturation before proceeding to the next stage. The second stage involved mapping participants' feelings and fears using a *Systematic Desensitization* technique. Participants were asked to reflect on and map their current emotional states, imagine exposure through the video stimulus, and rank their fears from least to most distressing using a pyramid diagram, with the most disturbing exposure placed at the top. At the end of the session, participants performed the *Applied Tension* technique, which involved tensing several muscle groups, including the neck, arms, chest, and legs, followed by re-measurement of heart rate and oxygen saturation.

Session 2: In this session, participants received an explanation of blood and injury-related stimuli through image-based exposure presented from a non-threatening perspective as part of a biofeedback approach. Heart rate and oxygen saturation were measured, followed by the Applied Tension technique as in the first session, after which physiological measurements were repeated.

Session 3: The procedures in this session were similar to those in Session 2; however, the exposure stimulus consisted of auditory cues. The Applied Tension technique was performed three times following the exposure.

Session 4: This session followed the same procedures as Session 3, with exposure delivered through video recordings of blood sampling procedures.

Session 5: In the final session, participants' responses to the previous four sessions were evaluated. Fear severity and perception related to blood sampling were assessed using the questionnaire, followed by comprehensive exposure involving verbal cues, sounds, images, and videos. Heart rate and oxygen saturation were then measured again, and the

Applied Tension technique was performed three times. Participants were subsequently asked for their willingness to undergo a blood glucose test. Of all participants, only one declined to undergo the blood glucose examination.

Result

This section presents the findings obtained from the study conducted to address the primary research objectives. The data presented include the key variables measured and comparisons among participant groups based on the predefined research criteria.

Table 1

Distribution of Respondent Characteristics

Characteristics	n	%
Age (years)		
18	5	20.8
19	18	75.0
20	1	4.2
Sex		
Male	2	8.3
Female	22	91.7
Number of CBT Sessions Attended		
2 sessions	7	29.2
3 sessions	3	12.5
4 sessions	5	20.8
5 sessions	9	37.5

The study involved 24 undergraduate students aged between 18 and 20 years. As shown in Table 1, the majority of respondents were 19 years old (75%), followed by those aged 18 years (20.8%) and 20 years (4.2%). Based on this age range, the respondents were categorized as late adolescents transitioning into early adulthood.

With regard to sex distribution, participants were selected using purposive sampling to ensure that they experienced fear related to blood sampling, injections, blood, or injuries. The results indicated that most respondents were female (91.7%), while male respondents accounted for 8.3%.

The CBT intervention was categorized according to the number of therapy sessions attended by the participants. Four groups were identified based on voluntary participation: the first group attended two sessions (29.2%), the second group attended three sessions (12.5%), the third group attended four sessions (20.8%), and the largest group (37.5%) completed all five CBT sessions.

Table 2

Wilcoxon One-Group Pretest–Posttest Test for Fear Severity and Perception

Variable	Pretest (n)	Pretest (%)	Posttest (n)	Posttest (%)	*p* value
Fear Severity Level					.346
Normal	12	50.0	16	66.67	
Abnormal	12	50.0	6	33.33	
Perception					.426

Variable	Pretest (n)	Pretest (%)	Posttest (n)	Posttest (%)	*p* value
Positive	12	50.0	10	41.67	
Negative	12	50.0	14	58.33	

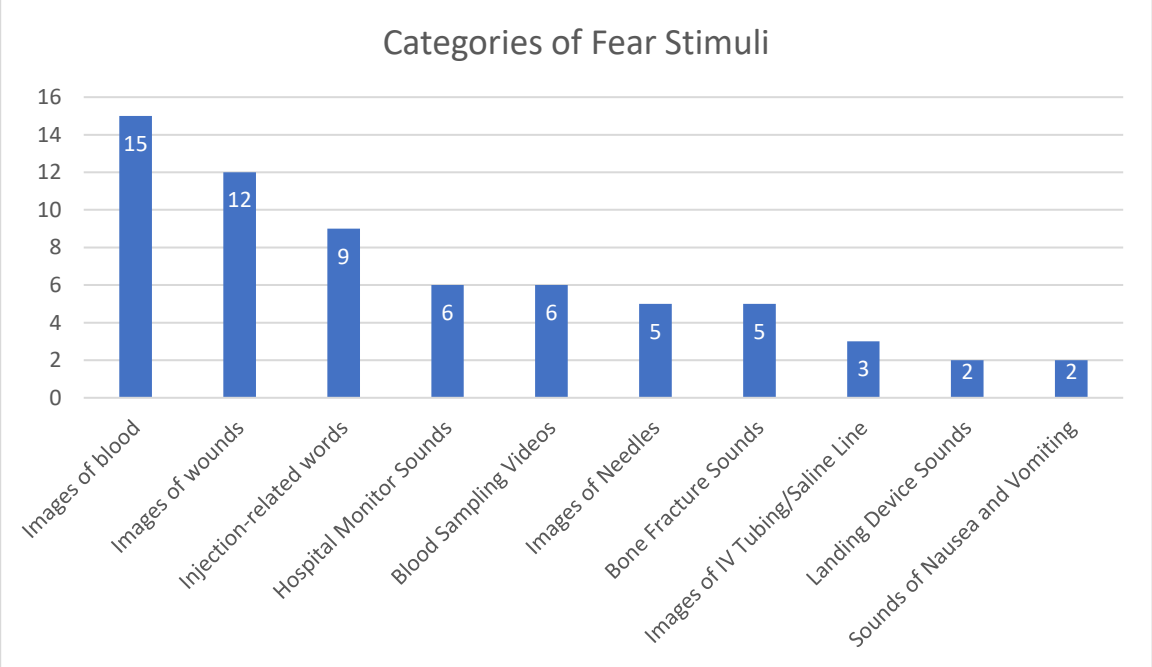
Note. p values were obtained using the Wilcoxon Signed Rank Test. Percentages may not total 100 due to rounding.

A total of 24 students participated as respondents in this study. For the variable of fear severity prior to the intervention, 50% of respondents were classified as having normal levels and 50% as having abnormal levels. Following the intervention, the proportion of respondents classified as normal increased to 66.67%, while those classified as abnormal decreased to 33.33%. Based on the Wilcoxon test results, the effect of CBT on fear severity was not statistically significant (p = 0.346). Nevertheless, a positive trend was observed when comparing pretest and posttest results.

Regarding the perception variable, prior to the intervention, 50% of respondents demonstrated positive perceptions and 50% negative perceptions. After the intervention, the proportion of respondents with positive perceptions decreased to 41.67%, whereas those with negative perceptions increased to 58.33%. The statistical analysis indicated that the effect of CBT on perception was not significant (p = 0.426). However, the comparison between pretest and posttest results showed a shift toward more negative perceptions, which may have been influenced by several contributing factors.

Figure 1

Frequency Distribution of Fear Stimuli Identified During the Systematic Desensitization Sessions



Note. The figure illustrates the distribution of stimuli that elicited fear responses among participants during the systematic desensitization phase. The most frequently reported stimuli were images of blood (*n* = 15) and images of wounds (*n* = 12), followed by injection-related words (*n* = 9). Auditory stimuli (e.g., hospital monitor sounds, bone fracture sounds, and landing device sounds) and combined visual–auditory stimuli (e.g., blood sampling videos) were reported less frequently.

Figure 1 illustrates the frequency distribution of clinically defined fear stimuli identified during the systematic desensitization sessions. The most prominent stimuli eliciting fear

responses were *visual exposure to blood* (n = 15) and *visual exposure to tissue injury* (n = 12), indicating that direct visual representations of blood-related cues constituted the primary sources of anxiety among participants. This was followed by *injection-related verbal stimuli* (n = 9), suggesting that linguistic cues alone were sufficient to evoke fear responses in a substantial proportion of participants.

Moderate frequencies were observed for *auditory exposure to medical monitoring equipment* (n = 6) and *visual exposure to venipuncture procedures* (n = 6), reflecting heightened sensitivity to both procedural sounds and dynamic visual representations of blood sampling. Lower frequencies were reported for *visual exposure to hypodermic needles* (n = 5) and *auditory exposure to traumatic injury sounds* (n = 5). The least frequently reported stimuli included *visual exposure to intravenous medical devices* (n = 3), *auditory exposure to mechanical medical devices* (n = 2), and *auditory exposure to gastrointestinal distress sounds* (n = 2). Overall, these findings indicate that visual stimuli, particularly those directly depicting blood and injury, were more likely to provoke fear responses than auditory or verbal stimuli among individuals with Blood-Injury-Injection Phobia.

Table 3

Kruskal–Wallis Test and Post Hoc Analysis

Variable	*H*	*df*	*p* value
Heart rate	10.878	4	.028
Oxygen saturation	3.453	4	.485

The results presented in Table 3 indicate that, for the heart rate variable, the p-value was less than 0.05 (p = 0.028), leading to the rejection of the null hypothesis. This finding suggests a statistically significant difference in heart rate reduction among participants who attended CBT sessions 1 through 5. In contrast, oxygen saturation yielded a p-value greater than 0.05 (p = 0.485), indicating that there was no statistically significant difference in oxygen saturation improvement across the CBT sessions.

Figure 2

Post Hoc Pairwise Comparisons of Mean Rank Scores Across Cognitive Behavioral Therapy Sessions

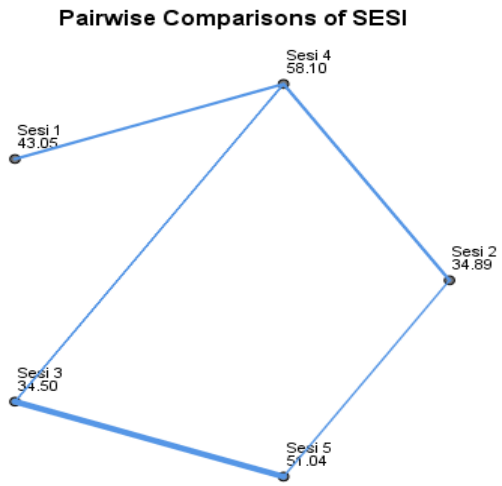


Figure 2 illustrates the post hoc pairwise comparisons of mean rank scores across the five Cognitive Behavioral Therapy (CBT) sessions. The highest mean rank score was observed in Session 4 (mean rank = 58.10), followed by Session 5 (mean rank = 51.04), indicating that these sessions were associated with the most pronounced reductions in heart rate. In contrast, lower mean rank scores were observed in Session 1 (43.05), Session 2 (34.89), and Session 3 (34.50), suggesting comparatively smaller physiological effects during earlier intervention stages. Based on the post hoc analysis, Sessions 4 and 5 were identified as the most significant sessions, as indicated by the highest mean rank scores associated with reductions in heart rate.

Discussion

1. Fear Severity

In this study, fear severity, as presented in Table 2, did not show a statistically significant reduction following the intervention. However, based on frequency distribution, a decrease was observed from 50% to 33.33%, indicating that half of the respondents initially classified as abnormal transitioned to the normal category after the intervention. Despite this positive trend, several barriers contributed to the non-significant statistical outcome. These barriers primarily originated from the participants themselves, as some did not complete the assigned therapeutic tasks, thereby limiting the attainment of optimal results. Additional constraints included limited therapy schedules influenced by academic supervision demands and deadline pressures.

In clinical practice, the effectiveness of CBT varies depending on individual conditions and predefined treatment objectives. According to Thng et al. (2020), the duration and intensity of therapy sessions significantly influence CBT outcomes. Furthermore, variability in exposure responses among participants may be attributed to differences in individual fear hierarchies. The non-significant reduction in fear severity observed in this study may also be explained by the relatively short exposure duration and the small sample size, factors that are commonly associated with limited statistical power in psychological intervention studies (Siregar & Hasanah Siregar, 2013; Thng et al., 2020). Another contributing factor is *disgust sensitivity*, which has been identified as a critical indicator of BIIP severity. Elevated disgust sensitivity toward blood and injury-related stimuli can intensify fear responses and trigger vasovagal reactions among individuals with BIIP (Siev et al., 2024). Consequently, fear severity among students may directly influence their readiness to undergo blood sampling procedures during laboratory activities.

2. Perception

Perception of fear represents the final physiological and cognitive process through which individuals experience anxiety. This process begins when fear-related signals reach the brain's processing centers, particularly the somatosensory cortex, where the location and intensity of the stimulus are interpreted, resulting in conscious awareness of fear. Concurrently, the limbic system plays a crucial role in modulating the emotional components of fear, including anxiety, apprehension, and frustration.

Several factors may influence fear perception, including cultural differences that shape how individuals interpret and express fear. In certain cultural contexts, social norms encourage emotional restraint, whereas in others, emotional expression is more readily accepted. Social support also plays a significant role in shaping fear perception, as it affects individuals' coping strategies and interactions with healthcare providers. Additionally, expectations and psychological attitudes toward fear-inducing stimuli contribute to

perceptual outcomes. Individuals with positive expectations may experience greater reductions in fear, while pessimistic attitudes may exacerbate fear perception. Fear perception is further influenced by prior experiences, which shape individuals' responses to similar stimuli in the future (Raharja, 2025).

The findings of this study are consistent with those reported by Wilson and Gullon-Scott (2024), who noted that the effectiveness of CBT in alleviating social anxiety may be limited when fear is rooted in direct personal experiences rather than maladaptive cognitive appraisals alone. While CBT is fundamentally designed to help individuals re-evaluate exaggerated fears, its effectiveness may be reduced when anxiety is grounded in realistic or previously experienced situations. As a result, therapeutic approaches that do not adequately address the experiential basis of anxiety may yield limited improvements in symptom reduction and emotional well-being.

3. Heart Rate

The heart rate variable demonstrated a statistically significant effect, with a p-value less than 0.05, indicating that CBT sessions effectively reduced participants' heart rates. The intervention consisted of five sessions, with the most pronounced reductions observed during the fourth and fifth sessions, as illustrated in Figure 2. These findings suggest that participants who completed more than four CBT sessions experienced greater physiological regulation, particularly in terms of cardiovascular responses.

Physiologically, individuals experiencing fear and anxiety tend to exhibit elevated heart rates due to autonomic nervous system activation. Anxiety stimulates the brain to release stress-related hormones, disrupting homeostasis and resulting in increased heart rate and blood pressure (Muslim & Arofiati, 2019). The *Applied Tension* technique employed in this study appears to have effectively modulated cardiovascular responses by alternately contracting and relaxing major muscle groups, including the neck, chest, arms, and legs. Following the completion of Applied Tension, participants exhibited marked reductions in heart rate and blood pressure.

Another factor influencing heart rate outcomes is the number and duration of therapy sessions. In this study, participants underwent up to five sessions, each lasting approximately 60 minutes and incorporating the Applied Tension technique. This dosage aligns with findings reported by Gunawan et al. (2025), who demonstrated that five 90-minute sessions effectively reduced phobia severity, as well as by Apriyanti et al. (2023), who suggested that a minimum of five sessions lasting 30–45 minutes is sufficient to produce therapeutic effects. Nevertheless, not all participants completed the full course of five sessions, which may explain why other variables—fear severity, perception, and oxygen saturation—did not reach statistical significance.

4. Oxygen Saturation

The oxygen saturation variable did not demonstrate a statistically significant change; however, a positive trend was observed, with posttest values increasing from 50% to 54%. According to Arda et al. (2020) and Wulandari and Wigunantiningsih (2022), variations in oxygen saturation may be influenced by physiological factors such as physical activity levels, individual health conditions, and environmental context, particularly when interventions are conducted in settings that simultaneously serve as exposure environments.

In the present study, CBT sessions were conducted on active academic days, often after participants had completed classes, and the intervention took place within the

laboratory environment where exposure stimuli were present. Previous research has shown that oxygen saturation levels may decrease before and after physical activity, consistent with Berman's theoretical framework, which posits that oxygen saturation measurements are influenced by hemoglobin levels, circulation, and activity intensity. Additional factors, including brief exposure duration and suboptimal technique application, may also have contributed to the non-significant changes observed in oxygen saturation and heart rate.

Furthermore, Triviño-Martínez et al. (2025) reported that intensive and realistic exposure delivered through virtual platforms may more effectively reduce physiological responses, such as elevated heart rate, among individuals with BIIP. In contrast, the present study observed a decline in positive perception following the intervention, which may be attributed to a mismatch between participants' initial expectations and the actual therapeutic outcomes. This finding aligns with Vergeer-Hagoort et al. (2024), who emphasized that congruence between initial expectations and therapeutic experiences plays a critical role in the acceptance and perceived effectiveness of psychological interventions.

Overall, the findings of this study have important implications for students' preparedness in participating in laboratory practicum involving blood specimens. Students with BIIP may encounter significant barriers during blood-related laboratory activities due to symptoms such as palpitations, dizziness, weakness, and visual disturbances. The four variables examined in this study collectively represent psychological and physiological factors that directly influence anxiety levels and fear responses, which in turn affect health and safety during laboratory practicum activities (Adinata et al., 2025).

Conclusion

This study demonstrates that *Cognitive Behavioral Therapy* (CBT) exerts a significant effect in reducing anxiety-related physiological responses, particularly heart rate, among students with *Blood-Injury-Injection Phobia* (BIIP). The reduction in heart rate indicates an improvement in autonomic regulation, which may help prevent syncope when individuals are exposed to blood-related stimuli during laboratory activities. This effect was most pronounced among participants who completed later stages of the intervention, suggesting that repeated and progressively intensified exposure combined with the *Applied Tension* technique plays a critical role in achieving therapeutic outcomes.

In contrast, other variables examined in this study—namely fear severity, perception, and oxygen saturation—did not demonstrate statistically significant changes following the intervention. Nevertheless, descriptive analysis revealed positive trends in the normalization of fear severity and oxygen saturation, indicating potential clinical relevance despite the absence of statistical significance. These findings suggest that CBT may contribute to partial symptom improvement, particularly at the physiological level, even when cognitive and perceptual changes are less pronounced.

Several limitations should be acknowledged. The pre-experimental design without a control group restricts the ability to establish causal relationships between the intervention and observed outcomes. Additionally, the relatively small sample size and variability in participants' attendance across CBT sessions may have influenced the magnitude of the effects observed. Consequently, the findings should be interpreted with caution.

Future research is recommended to employ more rigorous experimental designs, such as randomized controlled trials, with larger and more diverse samples. Greater attention should also be given to optimizing the number of sessions, duration of exposure,

and tailoring therapeutic techniques to individual fear profiles. Further investigation is needed to differentiate primary fear triggers from secondary or non-specific anxiety factors, thereby enhancing the effectiveness of CBT-based interventions for individuals with BIIP in educational and clinical settings.

Declarations

Author contribution statement

This study was conducted by five authors, two of whom were members of the Public Health Brave Buddies, a peer support group that provided assistance and support in the implementation of Cognitive Behavioral Therapy (CBT), data collection, and dissemination of the research findings. The first author initiated the study and was responsible for data collection, data analysis, and manuscript preparation. The second and third authors contributed to the validation of the findings and the refinement of the manuscript.

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Data availability statement

The data supporting the findings of this study are available upon reasonable and accountable request by contacting the corresponding author via email at: putridjamilahwahidah@um.ac.id

Declaration of interests statement

The authors declare that there are no financial conflicts of interest or personal relationships that could be perceived as influencing the research reported in this article.

Additional information

This study was conducted in collaboration with the Student Association of the Public Health Study Program, Universitas Negeri Malang, which provides orientation and adaptation programs for first-year students. This collaboration aimed to integrate Cognitive Behavioral Therapy (CBT) into early student activities in order to reduce or eliminate incidents of syncope caused by Blood-Injury-Injection Phobia (BIIP).

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